What is claimed is:

1. A noise cancellation system having compatibility with existing socket configurations, comprising:

an active headset, having at least a first earphone, a first microphone, and a first gain control element that provides gain control of the first microphone;

a noise cancellation circuit that is located remotely from the active headset and comprises an amplifier circuit that is coupled to the first earphone of the active headset; and

a plurality of electrical connections having a maximum number of electrical connections for connecting the noise cancellation circuitry to the active headset that is less than the number of electric connections required in a conventional active headset.

2. A noise cancellation system according to claim 1, wherein the active headset is a stereo headset further comprising a second earphone, a second microphone, and a second gain control element that provide gain control of the of the second microphone, and wherein the maximum number of electrical connections is seven.

3. A noise cancellation system according to claim 1, wherein the active headset is a mono headset and wherein the maximum number of electrical connections is four.

4. A noise cancellation system according to claim 1, wherein the active headset is a mono headset comprising a boom microphone and wherein the maximum number of electrical connections is five.

5. A noise cancellation system according to claim 2, wherein the electrical connections comprises two stereo jack plugs.

6. A noise cancellation system according to claim 3, wherein the electrical connections comprises two mono jack plugs.

7. A noise cancellation system according to claim 3, wherein the electrical connections comprises a stereo jack plug.

8. A noise cancellation system according to claim 4, wherein the electrical connections comprise a stereo jack plug and a mono jack plug.

9. A noise cancellation system according to claim 2, wherein the electrical connections comprise a six pin connector.

10. A noise cancellation system according to claim 3, wherein the electrical connections comprise at least one of a three pin connector and a four pin connector.

11. A noise cancellation system according to claim 4, wherein the electrical connections comprise at least one of a four pin connector and a five pin connector.

12. A noise cancellation system according to claim 2, wherein the electrical connections comprises a seven pin connector.

13. A noise cancellation system according to claim 1, wherein the first microphone is coupled to a noise cancellation controller of the noise cancellation circuit at a first electrical connection of the plurality of electrical connections, the first microphone is coupled to a first voltage potential at a second electrical connection of the plurality of electrical connections, and said first microphone is coupled in parallel with said first gain control element.

14. A noise cancellation system according to claim 1, wherein a first current source of a noise cancellation controller of the noise cancellation circuit comprises:

a voltage source element; and

a bootstrapping capacitor coupled to the voltage source element and coupled to the first microphone to provide a correct bias voltage to said first microphone;

wherein the coupling of the bootstrapping capacitor to the voltage source element causes the voltage source element to be operable as a current source within an operational frequency range of the active headset.

15. A noise cancellation system according to claim 13, wherein the gain of the first microphone is adjustable by a first adjustment element that is the first gain control element.

16. A noise cancellation system according to claim 2, wherein the first microphone is coupled to the noise cancellation controller at a first electrical connection of the plurality of electrical connections, the first microphone is coupled to the second microphone and a first voltage potential at a second electrical connection of the plurality of electrical connections, the second microphone is coupled to the noise cancellation controller at a third electrical connection of the plurality of electrical connections, and said first and second microphones are coupled in parallel with said first gain control element.

17. A noise cancellation system according to claim 16, wherein the first voltage potential is ground potential.

18. A noise cancellation system according to claim 16, wherein the gain of the first microphone is adjustable by a first adjustment element that is the first gain control element and the gain of the second microphone is adjustable by a second adjustment element that is the second gain control element.

19. A noise cancellation system according to claim 2, wherein a circuit of the active headset comprises:

a resistive element coupled to the first earphone and the second earphone to define a first electrical connection of the plurality of electrical connections, wherein the first earphone is coupled to a second electrical connection of the plurality of electrical connections and the second earphone is coupled to a third electrical connection of the plurality of electrical connections;

a capacitive element, wherein the first microphone, the second microphone, and a first terminal of the capacitive element are coupled together to define a fourth electrical connection of the plurality of electrical connections;

a first adjustment element coupled to the first microphone at a fifth electrical connection of the plurality of electrical connections; and

a second adjustment element coupled to the second microphone at a sixth electrical connection of the plurality of electrical connections,

wherein the adjustment elements are coupled to the resistive element.

20. A noise cancellation system according to claim 1, wherein a circuit of the active headset comprises:

a resistive element coupled to the first earphone to define a first electrical connection of the plurality of electrical connections, wherein the first earphone is coupled to a second electrical connection of the plurality of electrical connections;

a capacitive element, wherein the first microphone, and a first terminal of the capacitive element are coupled together to define a third electrical connection of the plurality of electrical connections;

a first adjustment element coupled to the first microphone at a fourth electrical connection of the plurality of electrical connections; and

wherein the first potentiometer is coupled to the resistive element.

21. A noise cancellation system according to claim 2, wherein the first earphone has a first terminal and a second terminal and is characterized as having an impedance and the second earphone has a first terminal and a second terminal and is characterized as having an impedance; and

wherein a common contact in the amplifier circuit of the noise cancellation circuitry serves as an input connection to the first terminal of the first earphone and the first terminal of the second earphone.

22. A noise cancellation system according to claim 21, wherein the common contact is coupled to a voltage source.

23. A noise cancellation system according to claim 21, wherein the common contact is coupled to a voltage reference.

24. A noise cancellation system according to claim 21, the amplifier circuit further comprising:

a first amplifier connected to the first earphone that amplifies signals to the first earphone;

a second amplifier connected to the second earphone that amplifies signals to the second earphone; and

a third amplifier that couples the first earphone to the second earphone and is connected to the common contact, wherein the third amplifier acts as a virtual ground for the first earphone and the second earphone.

25. A noise cancellation system according to claim 1, the active headset further comprising:

a second microphone and a second gain control element that provides gain control for the second microphone.

26. A noise cancellation system according to claim 25, wherein the noise cancellation circuitry further comprises:

a first bootstrapped emitter follower transistor and a second bootstrapped emitter follower transistor which behave as current sources at audio frequencies and provide a correct bias voltage simultaneously to the first microphone and second microphone, respectively, wherein the first microphone of the first earpiece has a first terminal and a second terminal and the second microphone of the second earpiece has a first terminal and a second terminal, so that a common contact serves as an input connection to the first terminal of the first microphone and the first terminal of the second microphone.

27. A noise cancellation system according to claim 26, wherein the noise cancellation controller comprises:

a first current source that provides a first bias voltage to the first microphone; and

a second current source that provides a second bias voltage to the first microphone.

28. A noise cancellation system according to claim 27, wherein the first current source comprises:

a first emitter-follower transistor having a base provided with the first bias voltage, a collector coupled to a second voltage potential, and an emitter coupled to a first electrical connection of the plurality of electrical connections; and

a first bootstrapping capacitor that couples the base of the first emitter-follower transistor to the first electrical connection of the plurality of electrical connections; and wherein the second current source comprises:

a second emitter-follow transistor having a base provided with the second bias voltage, a collector coupled to the second voltage potential, and an emitter coupled to the third electrical connection of the plurality of electrical connections; and

a second bootstrapping capacitor that couples the base of the second emitter-follower transistor to the third electrical connection of the plurality of electrical connections.

29. A noise cancellation system capable of preventing noise transients that result upon plugging and unplugging a headset according to claim 28, wherein the noise cancellation circuit has a transient detector capable of preventing noise transients that

result upon plugging and unplugging the active headset, wherein the transient detector comprises:

a window comparator; and

a mute logic circuit that mutes an output signal of the noise cancellation circuit received by the first earphone and the second earphone when the output signal exceeds a predetermined amplitude level.

30. A noise cancellation system according to claim 1, wherein the noise cancellation controller comprises:

a first current source that provides a first bias voltage to the first microphone.

31. A noise cancellation system according to claim 30, wherein the first current source comprises:

a first emitter-follower transistor having a base provided with the first bias voltage, a collector coupled to a second voltage potential, and an emitter coupled to the first electrical connection of the plurality of electrical connections; and

a first bootstrapping capacitor that couples the base of the first emitter-follower transistor to the first electrical connection of the plurality of electrical connections.

32. A noise cancellation system capable of preventing noise transients that result upon plugging and unplugging a headset according to claim 31, wherein the noise cancellation circuit has a transient detector capable of preventing noise transients that

result upon plugging and unplugging the active headset, wherein the transient detector comprises:

a window comparator; and

a mute logic circuit that mutes an output signal of the noise cancellation circuit received by the first earphone when the output signal exceeds a predetermined amplitude level.

33. A noise cancellation system according to claim 25, wherein the noise cancellation circuitry further comprises:

a first operational amplifier and a second operational amplifier which act as current sources over the operating frequency range of the active headset and also provide correct bias voltage simultaneously to the first microphone and second microphone, respectively, wherein the first microphone of the first earpiece has a first terminal and a second terminal and the second microphone of the second earpiece has a first terminal and a second terminal, so that a common contact serves as an input connection to the first terminal of the first microphone and the first terminal of the second microphone.

34 A noise cancellation system according to claim 1, wherein the noise cancellation circuitry further comprises:

a first operational amplifier which acts as a current sources over the operating frequency range of the active headset and also provides a correct bias voltage to the first microphone, wherein the first microphone of the first earpiece has a first terminal

and a second terminal and the second microphone of the second earpiece has a first terminal and a second terminal.

35. A noise cancellation system according to claim 1, wherein the noise cancellation circuit is integral to a passenger cabin of a vehicle.

36. A noise cancellation system according to claim 35, wherein the noise cancellation circuit is provided in an arm rest of an aircraft seat.

37. A noise cancellation system according to claim 36, wherein the arm rest is provided with a first stereo jack plug socket and a second stereo jack plug socket.

38. A noise cancellation system according to claim 37, wherein the active headset has a first earpiece and a second earpiece, with the first earpiece having a first earphone and a first microphone and the second earpiece having a second earphone and a second microphone, wherein the first stereo jack plug socket provides for three input electrical connections of the plurality of electrical connections to the first microphone in the first earpiece and the second microphone in the second earpiece and the second stereo jack plug socket provides three input electrical connections to the first earphone in the first earpiece and the second earphone in the second earpiece.

39. A noise cancellation system according to claim 1, wherein the remote noise cancellation circuit is provided in an arm rest of an aircraft seat and the arm rest is provided with a six contact socket.

40. A noise cancellation system according to claim 1, wherein the noise cancellation circuit includes a transient detector.

41. A noise cancellation system according to claim 1,

wherein the transient detector includes a window comparator and a mute logic circuit for muting at least a first signal to at least the first earphone when the at least first signal exceeds a predetermined amplitude.

42. A noise cancellation system according to claim 1, said active headset further comprising:

a microphone terminal of the first microphone;

a headphone terminal of the first headphone at a direct current potential with respect to the microphone terminal; and

a decoupling network operable on a signal at the headphone terminal to supply power for the first microphone and the first gain control element;

wherein a Wire-ORed output of the first microphone and the first gain control element is AC coupled to a microphone output terminal of the active headset.

43. A noise cancellation system, comprising:

an active headset, having at least a first earphone, a first microphone, and a first gain control element for controlling the gain of the first microphone;

a noise cancellation circuit which is contained within the active headset; and

a connection means having four contacts for connecting the noise cancellation circuit to the active headset, wherein the four contacts are used to power the noise cancellation circuit contained within the active headset.

44. A noise cancellation system according to claim 43, wherein the connection means is a stereo plug and socket pair, with the stereo plug having an extended length and a contact at the end of the extended length stereo plug that is beyond the distance that a stereo plug would normally extend and with the socket having a contact operatively configured for receiving power from the contact on the stereo plug and providing power to the active circuitry.

45. A noise cancellation system according to claim 44, wherein the stereo plug is compatible with existing socket configurations.

46. A noise cancellation system according to claim 45, wherein the stereo plug has a plurality of contacts and a length that is switchable between a conventional stereo plug length and an extended stereo plug length and wherein the contacts of the stereo plug are reconfigured to provide power when the stereo plug is the extended stereo plug length.

47. A noise cancellation system having compatibility with existing socket configurations, comprising:

an active headset, having at least a first earphone, a first microphone, and a first gain control element for controlling a gain of the first microphone;

a noise cancellation circuit, at least a portion of which is contained within the active headset;

a plurality of electrical connections for connecting the active headset to the noise cancellation circuit wherein the electrical connections are compatible with standard audio equipment; and

a powering means, remote from the active headset, that provides power to the portion of the noise cancellation circuit that is contained within the active headset.

48. A noise cancellation system according to claim 47, wherein the powering means comprises:

an external device having a battery and a dual-function power supply socket;

an active headset power plug; and

wherein the dual-function power supply socket is operatively configured to receive power for the external device when a power source is plugged into the dual-function power supply socket and to provide power to the noise cancellation circuit from the battery when the active headset power plug is plugged into the dual-function power supply socket.

49. A noise cancellation system according to claim 48, wherein the battery does not supply power to the external device when a power source is plugged into the power supply socket.

50. A noise cancellation system according to claim 47, wherein the powering means comprises:

an external device having a battery and a dual-function power supply socket;

an active headset power plug; and

wherein the active headset power plug has a rear power socket and is configured to provide power to the external device and the noise cancellation circuit from a power source when the power source is plugged into the rear power socket of the active headset power plug.

51. A noise cancellation system according to claim 47, wherein the powering means comprises:

an external device having a battery and a line out socket;

an active headset power plug; and

wherein the line out socket is operatively configured to automatically switch to provide power to the noise cancellation circuitry from the battery when the active headset power plug is plugged into the line out socket.

52. A noise cancellation system according to claim 51, wherein the powering means further comprises a sensing system that uses an ultrasonic test tone to determine when the line out socket is switched to provide power to the noise cancellation circuitry.

53. A noise cancellation system according to claim 51, wherein the powering means further comprises a sensing system that monitors current drawn by the active headset to determine when the line out socket is switched to provide power to the noise cancellation circuitry.

54. A noise cancellation system according to claim 51, wherein the powering means further comprises a sensing system within the active headset that has an application specific integrated circuit which injects a digital identification code onto a microphone signal that can be read by an external device in order to determine when the line out socket is switched to provide power to the noise cancellation circuitry.

55. A noise cancellation system according to claim 47, wherein the powering means comprises an external device having a battery and a plurality of retractable contacts on the connection means and wherein the retractable contacts are operatively configured to provide power to the noise cancellation circuitry from the battery when an active headset is connected to the external device.

56. A noise cancellation system according to claim 47, wherein the powering means uses phantom powering to provide power to the noise cancellation circuitry wherein the

presence of the active headset is sensed so that direct current is not applied to a passive headset.

57. A noise cancellation system according to claim 56, wherein the phantom powering is disabled when a non-active headset is used.

58. A noise cancellation system according to claim 57, wherein the powering means further comprises a sensing system that uses an ultrasonic test tone to determine when the non-active headset is used and the phantom powering is disabled.

59. A noise cancellation system according to claim 57, wherein the powering means further comprises a sensing system that monitors current drawn by the active headset to determine when the non-active headset is used and the phantom powering is disabled.

60. A noise cancellation system according to claim 57, wherein the powering means further comprises a sensing system within the active headset that has an application specific integrated circuit which injects a digital identification code onto a microphone signal that can be read by an external device in order to determine when the non-active headset is used and the phantom powering is disabled.

61. A noise cancellation system according to claim 47, wherein the powering means is a superimposed positive DC voltage on a conventional analog output to provide power to the noise cancellation circuitry.

62. A noise cancellation system according to claim 47, wherein the powering means comprises a pulse width modulator circuit that is modulated by an audio signal and that produces a square wave having a higher frequency than the desired audio frequency and a rectification and storage means,

wherein when the active headset is plugged into the noise cancellation circuit, the square wave produced by the pulse width modulator circuit is rectified and filtered by the rectification and storage means to produce a power signal and is filtered to recover the audio signal.

63. The noise cancellation system of claim 47, wherein the pulse width modulator circuit is disabled upon detection of a passive headset being plugged into the noise cancellation circuit.

64. A noise cancellation system according to claim 63, wherein the powering means further comprises a sensing system that uses an ultrasonic test tone to detect when the passive headset is plugged into the noise cancellation circuit.

65. A noise cancellation system according to claim 63, wherein the powering means further comprises a sensing system that monitors current drawn by the active headset to detect when the passive headset is plugged into the noise cancellation circuit.

66. A noise cancellation system according to claim 63, wherein the powering means further comprises a sensing system within the active headset that has an application specific integrated circuit which injects a digital identification code onto a microphone signal that can be read by an external device in order to detect when the passive headset is plugged into the noise cancellation circuit.

67. A noise cancellation system according to claim 47, wherein the powering means comprises an audio signal produced by an external device, wherein the volume of the audio signal is maximized and then rectified to charge an energy storage element so that the active headset is powered by the audio signal during its peaks and by the energy storage element otherwise.

68. A noise cancellation system according to claim 67, wherein the energy storage element is a reservoir capacitor.

69. A noise cancellation system according to claim 67, wherein the energy storage element is a battery.

70. A noise cancellation system according to claim 67, wherein the audio signal is rectified by a diode element and the energy storage element is charged through a current limiting resistor.

71. A noise cancellation system according to claim 67, wherein a switched-mode power supply is used to boost the audio signal level so that the energy storage element may be charged even when the voltage of the audio signal is less than the voltage of the energy storage element.

72. A noise cancellation system according to claim 67, wherein distortion introduced by the resistance of a cable of the active headset may be reduced by a linearized charging circuit that provides a constant load impedance in order to reduce distortion of the audio signal.

73. A noise cancellation system having compatibility with existing socket configurations, comprising:

an active headset, having at least a first earphone, a first microphone, and a gain control element for controlling a gain of the first microphone;

a noise cancellation circuit, a portion of which is contained within an external device;

a plurality of electrical connections for connecting the active headset to the noise cancellation circuit; and

a powering means that provides power to the portion of the noise cancellation circuit that is contained within the external device.

74. A noise cancellation system according to claim 73, wherein the external device is a consumer stereo equipment.

75. A noise cancellation system according to claim 73, wherein the powering means comprises a dual-function socket of the external device, wherein when the active headset is plugged into the dual-function socket of the external device, the dual-function socket serves an auxiliary function.

76. A noise cancellation system according to claim 75, wherein the powering means further comprises a sensing system that uses an ultrasonic test tone to determine when the dual-function socket is switched to the auxiliary function.

77. A noise cancellation system according to claim 75, wherein the powering means further comprises a sensing system that monitors current drawn by the active headset to determine when the dual-function socket is switched to the auxiliary function.

78. A noise cancellation system according to claim 75, wherein the powering means further comprises a sensing system within the active headset that has an application specific integrated circuit which injects a digital identification code onto a microphone

signal that can be read by an external device in order to determine when the dual-function socket is switched to the auxiliary function.

79. A noise cancellation system according to claim 73, wherein the powering means comprises a pulse width modulator circuit that is modulated by an audio signal and that produces a square wave having a higher frequency than the desired audio frequency and a rectification and storage means,

wherein when the active headset is plugged into the noise cancellation circuit, the square wave produced by the pulse width modulator circuit is rectified and filtered by the rectification and storage means to produce a power signal and is filtered to recover the audio signal, and

wherein during a positive portion of the square wave, the first earphone and the second earphone of the active headset are disconnected and an output signal of a microphone of the active headset is simultaneously connected into the external device so that the output signal of the microphone can be measured.

80. The noise cancellation system of claim 79, wherein the pulse width modulator circuit is disabled upon detection of a passive headset being plugged into the noise cancellation circuit.

81. A noise cancellation system according to claim 80, wherein the powering means further comprises a sensing system that uses an ultrasonic test tone to detect when the passive headset is plugged into the noise cancellation circuit.

82. A noise cancellation system according to claim 80, wherein the powering means further comprises a sensing system that monitors current drawn by the active headset to detect when the passive headset is plugged into the noise cancellation circuit.

83. A noise cancellation system according to claim 80, wherein the powering means further comprises a sensing system within the active headset that has an application specific integrated circuit which injects a digital identification code onto a microphone signal that can be read by an external device in order to detect when the passive headset is plugged into the noise cancellation circuit.

84. The noise cancellation system according to claim 73, wherein the powering means comprises superimposing an audio signal upon a positive DC voltage level to produce a resultant signal having a voltage level that is maintained at a positive voltage potential,

wherein the audio signal is filtered out of the resultant signal to produce a DC signal that powers the portion of the noise cancellation circuit, and

wherein a plurality of high frequency negative-going spikes are superimposed upon a drive signal and during the plurality of negative-going spikes the first earphone and the second earphone of the active headset are disconnected and an output signal of a microphone of the active headset is simultaneously connected into the external device so that the output signal of the microphone can be measured.

85. A noise cancellation system according to claim 84, wherein the audio signal is filtered out by a resistive element and a capacitive element.

86. A noise cancellation system according to claim 73, wherein the powering means adds a first DC offset to a first drive signal of the first earphone and the first earphone is capacitor coupled to remove the first DC offset, and

wherein the powering means includes a bridge circuit in the external device that operates to separate a first microphone signal from the first drive signal, and

wherein the impedance of the first earphone is measured when the active headset is plugged-in in order to enable the bridge circuit to cancel the first drive signal, leaving the first microphone signal.

87. A noise cancellation system according to claim 86, wherein a test signal is used to measure the impedance of the first earphone and the impedance of the second earphone when the active headset is plugged-in.

88. A noise cancellation system according to claim 73, wherein the active headset is a stereo headset further comprising a second earphone and wherein the powering means comprises:

a DC voltage upon which a radio frequency carrier employing a high frequency oscillator is imposed in the active headset, wherein the radio frequency carrier is modulated by a microphone output signal of a microphone and demodulated in the external device to recover the microphone output signal, the output signal of the high frequency oscillator is capacitively coupled to a drive signal of the first earphone and a drive signal of the second earphone, and the radio frequency carrier is blocked from a power source of the microphone by a radio frequency inductive element.

89. A noise cancellation system having compatibility with existing socket configurations, comprising:

an active headset, having an earphone and a microphone coupled to a common ground;

a noise cancellation circuit, a portion of which is contained within an external device;

a plurality of electrical connections for connecting the active headset to the noise cancellation circuit; and

a powering means that provides power to the portion of the noise cancellation circuit that is contained within the external device,

wherein crosstalk between a earphone signal produced by the earphone and a microphone signal produced by the microphone is eliminated by placing a resistive element between the common ground and circuit ground, sensing a voltage drop across

the resistive element, and subtracting a proportion of the voltage drop from the microphone signal necessary to eliminate the crosstalk.

90. A transient elimination circuit contained within a headset, comprising:

a first resistive element having a first terminal and a second terminal, with the first terminal coupled to a headphone common;

a potentiometer having a first terminal and a second terminal;

a decoupling capacitor having a first terminal and a second terminal, with the first terminal of the decoupling capacitor coupled to a second terminal of the first resistive element and a first terminal of the potentiometer;

a coupling capacitor having a first terminal and a second terminal;

a microphone having a first terminal and a second terminal, with the first terminal of the microphone coupled to the second terminal of the potentiometer and the first terminal of the coupling capacitor; and

a second resistive element having a first terminal and a second terminal, with the first terminal of the second resistive element coupled to the second terminal of coupling capacitor to form a microphone output signal and with the second terminal of the second resistive element coupled to the second terminal of the decoupling capacitor and the second terminal of the microphone to form a microphone common,

wherein the headphone common is at a DC voltage potential with respect to the microphone common and is filtered to provide power to the microphone, and

wherein when the headset is plugged or alternately unplugged, the decoupling capacitor is slowly charged or alternately discharged through the first resistive element so as to not cause a transient condition.